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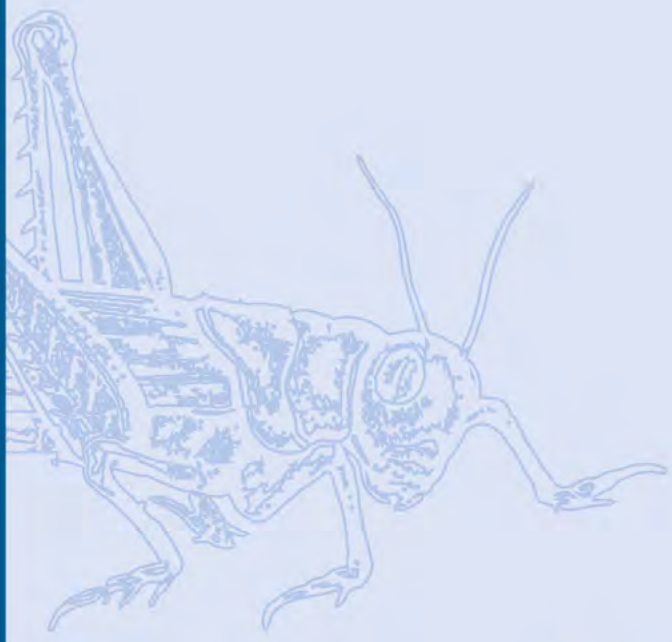

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Forecasting locust risks

FORECASTS OF DESERT LOCUST PRESENCE IN MOROCCO COUPLING REMOTE SENSING IMAGERY AND FIELD SURVEYS

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With the objective of improving preventive management of desert locust, an operational system was developed to help in the planning of field surveys in Morocco. This operational system produce regularly some presence probability maps of solitarious or transiens desert locust. The spatial resolution is 25km over the Moroccan territory and the temporal horizon of the forecasts are 40 days.

The forecasts are based on statistical models coupling historical data of field surveys with several layers of remote sensing imagery. These images are proxy of environmental variables important for desert locust: temperature, rainfall and vegetation availability. The statistical coupling was realised with random forest models. These models were assessed with a splitting of the data to evaluate the forecast errors and validate the approach. An automatic process was also developed to transform new remote sensing imagery into probability maps in order to operationalize the system.

As the system has been running for over 3 years, another level of evaluation can be

presented: the correspondence between the forecasts of probability of locust presence and the actual observations of field survey teams of the national anti-locust centre of Morocco since 2015.

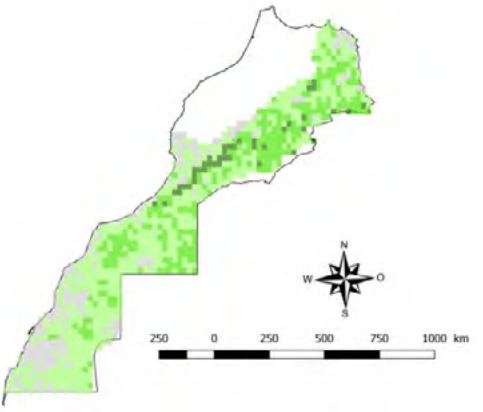

Figure 1. Example of probability map of the operational system with levels of green indicating probability of presence of desert locust (gray=0; dark green =1)

Key Words: Schistocerca gregaria, random forest models, forecasting tool, remote sensing